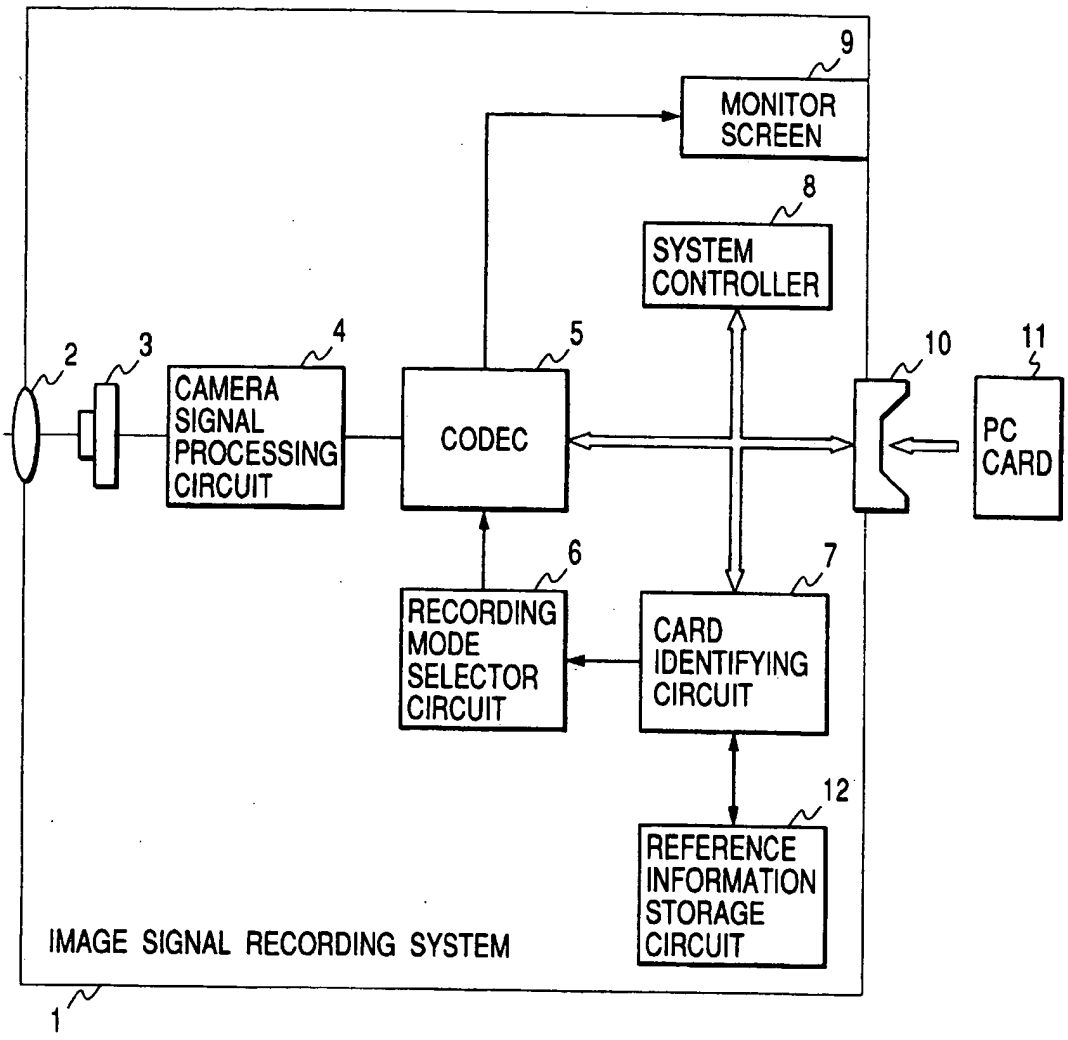


FIGURE 1

(PRIOR ART)

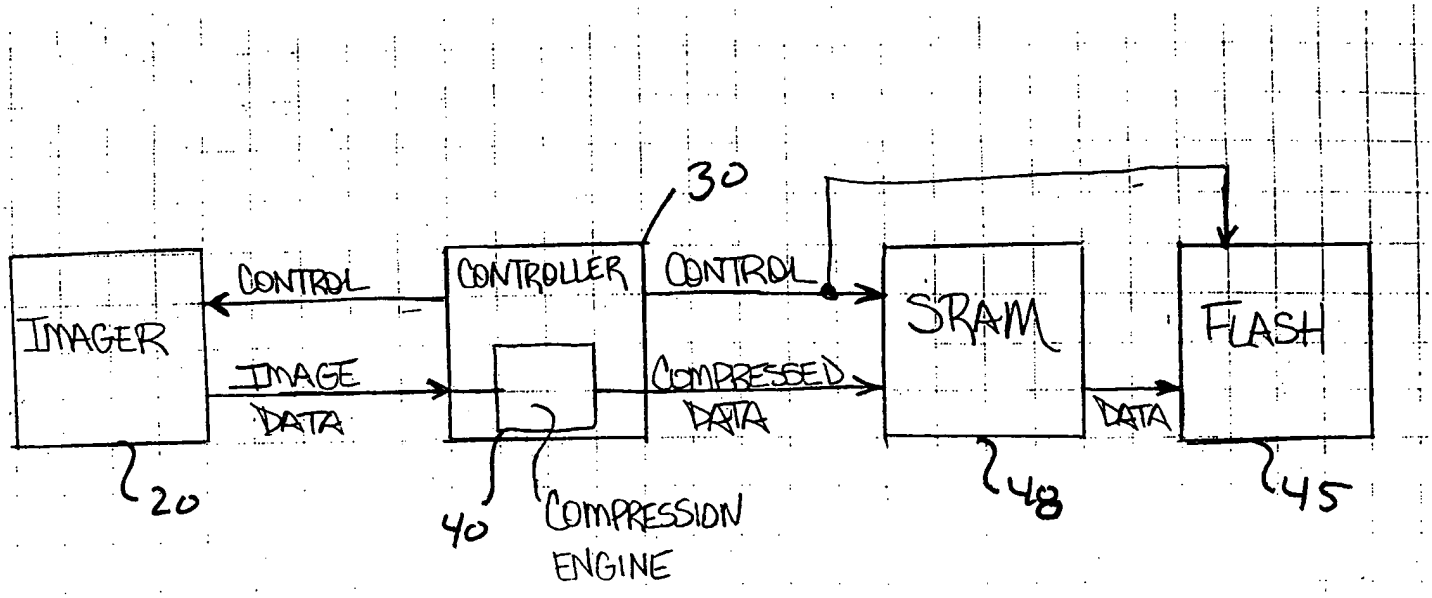


FIGURE 2

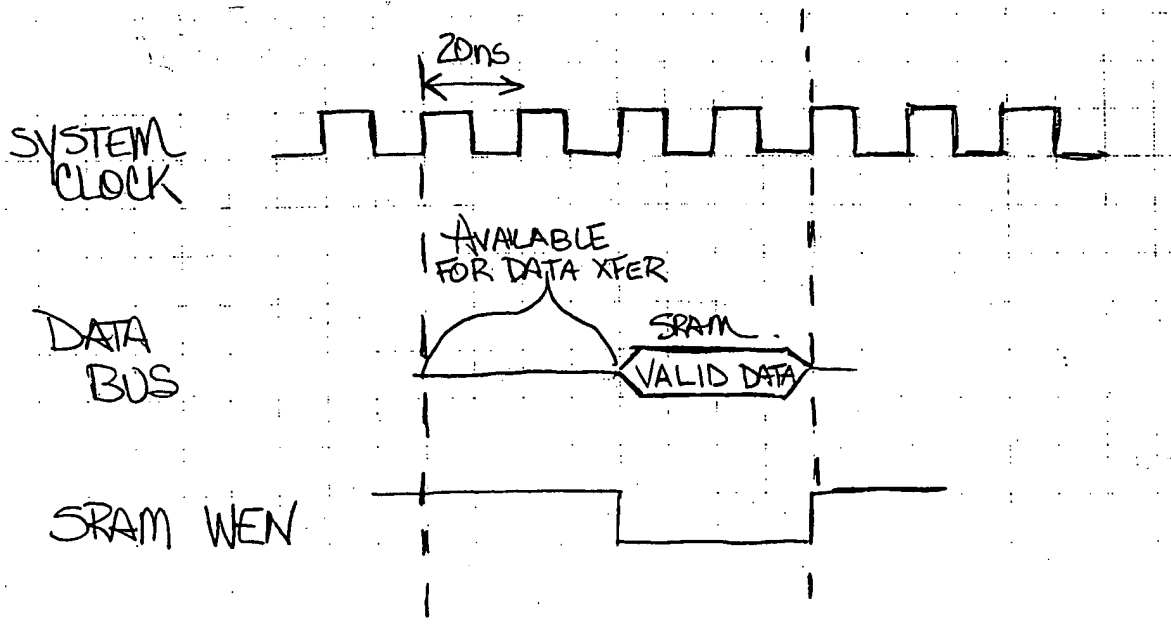
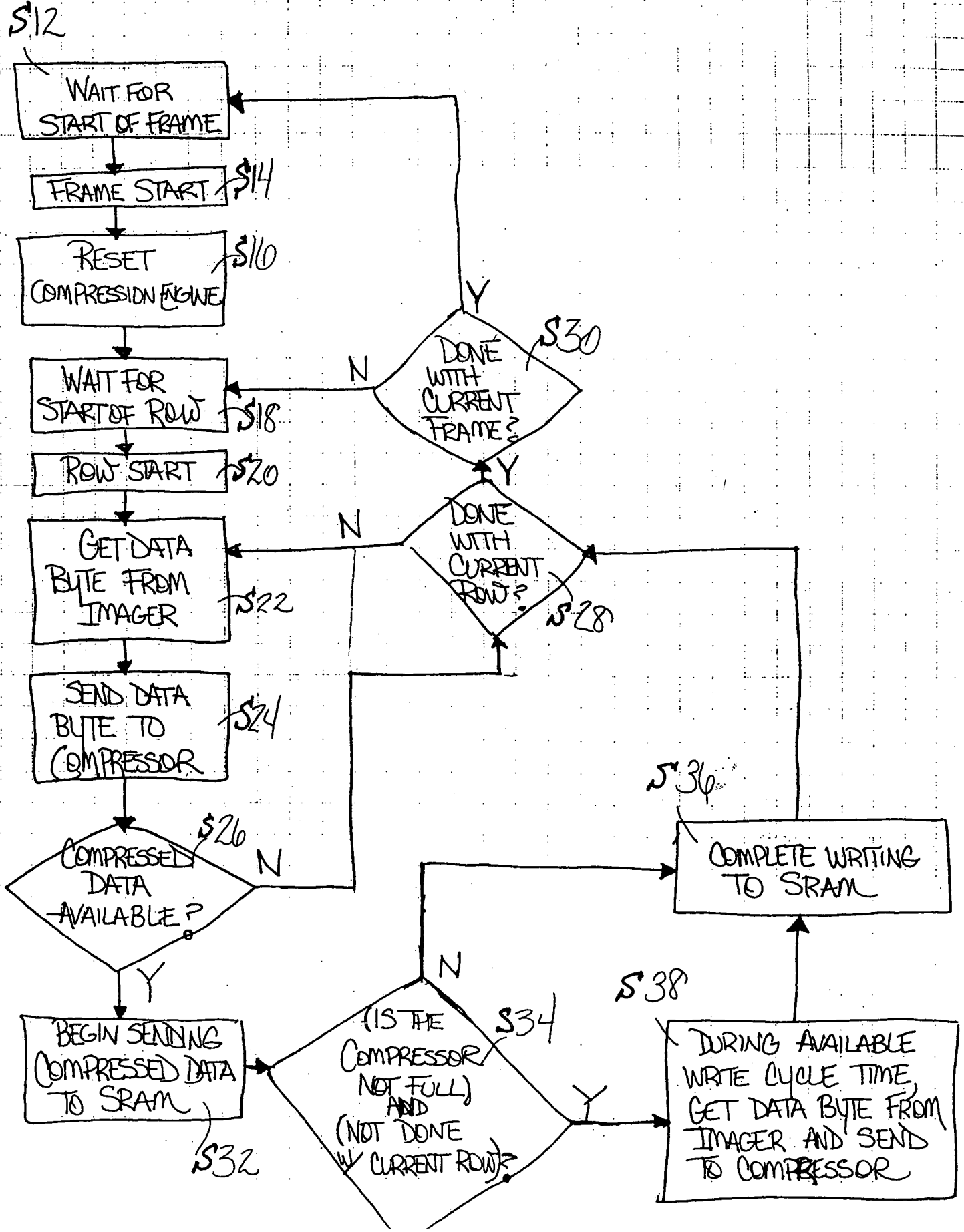


FIGURE 3

FIGURE 4


S12
WAIT FOR START OF FRAME
FRAME START
S14
RESET COMPRESSION ENGINE
S16
WAIT FOR START OF ROW
S18
ROW START
S20
GET DATA BYTE FROM IMAGER
S22
SEND DATA BYTE TO COMPRESSOR
S24
COMPRESSED DATA AVAILABLE?
S26
N
Y
BEGIN SENDING COMPRESSED DATA TO SRAM
S32
(IS THE COMPRESSOR NOT FULL) AND (NOT DONE W/ CURRENT ROW)?
S34
N
Y
DURING AVAILABLE WRITE CYCLE TIME, GET DATA BYTE FROM IMAGER AND SEND TO COMPRESSOR
S38
COMPLETE WRITING TO SRAM
S36
DONE WITH CURRENT ROW?
S28
N
Y
DONE WITH CURRENT FRAME?
S30
N
Y

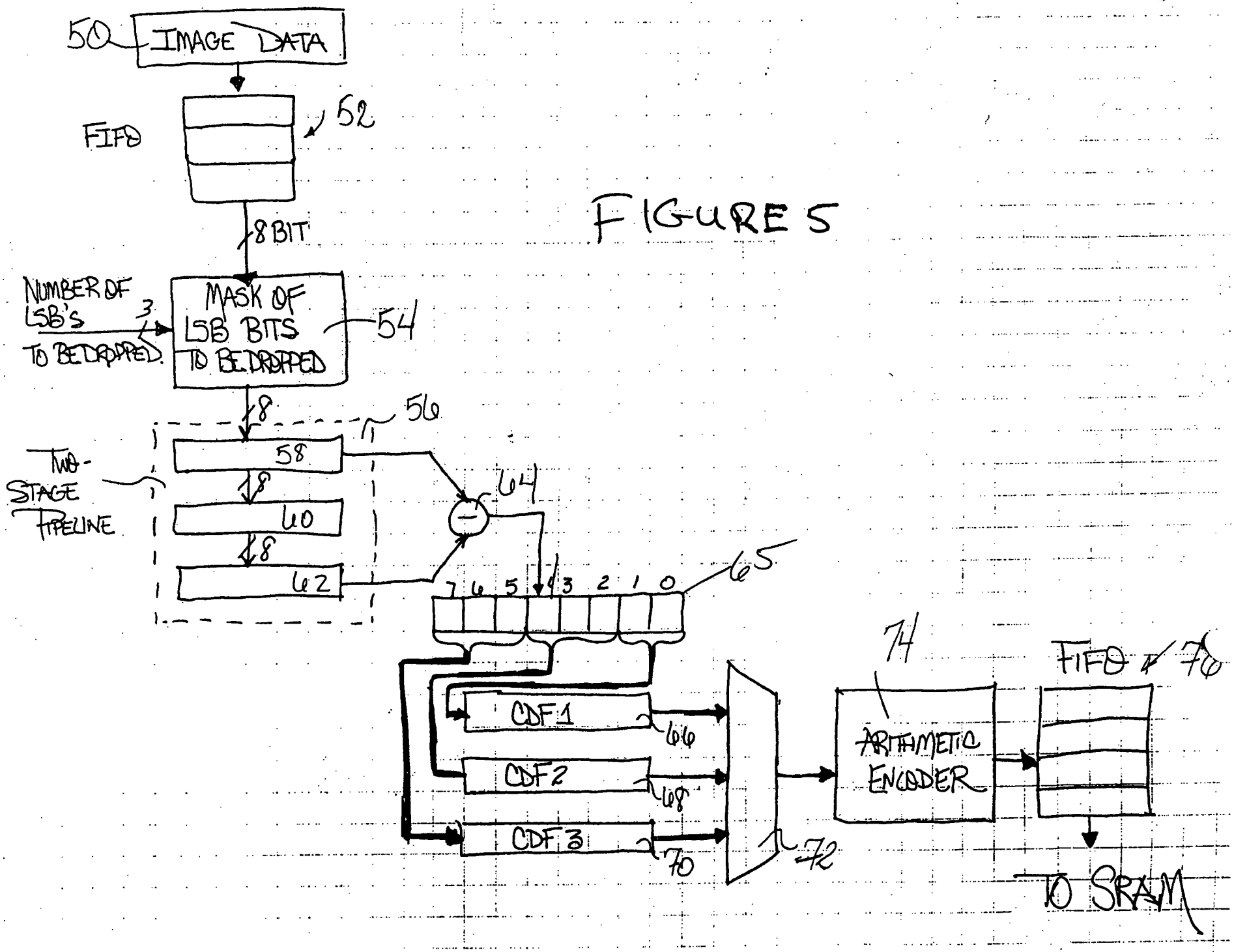
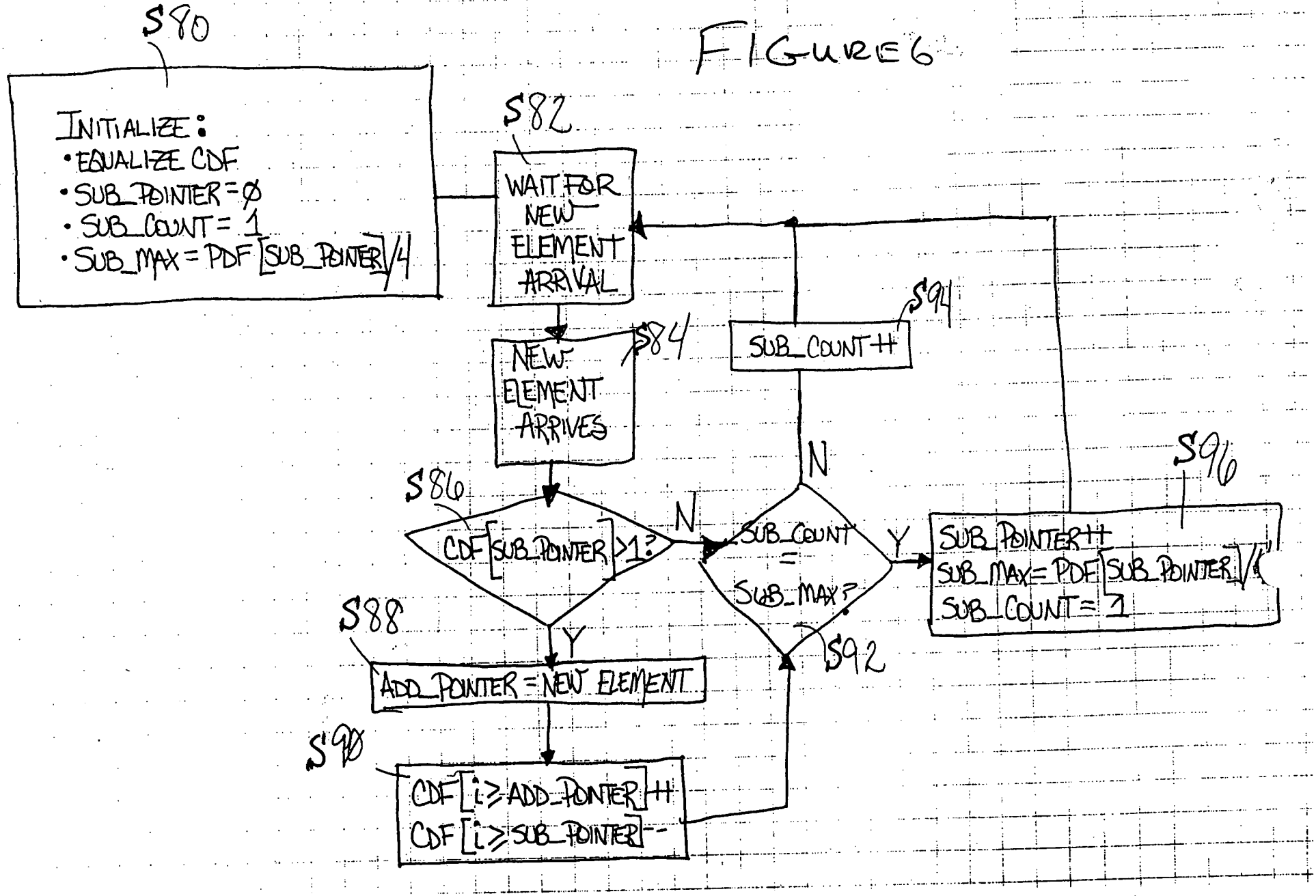

50
IMAGE DATA
FIFO
52
8 BIT
NUMBER OF LSB'S TO BE DROPPED
3
MASK OF LSB BITS TO BE DROPPED
54
8
56
TWO-STAGE PIPELINE
58
8
60
8
62
64
7 6 5 4 3 2 1 0
65
CDF 1
66
CDF 2
68
CDF 3
70
72
74
ARITHMETIC ENCODER
FIFO
76
TO SRAM

FIGURE 5

FIGURE 6


S80
INITIALIZE:
• EQUALIZE CDF
• SUB_POINTER = 0
• SUB_COUNT = 1
• SUB_MAX = PDF[SUB_POINTER]/4
S82
WAIT FOR NEW ELEMENT ARRIVAL
S84
NEW ELEMENT ARRIVES
S86
CDF[SUB_POINTER] > 1?
N
Y
S88
ADD_POINTER = NEW ELEMENT
S90
CDF[i ≥ ADD_POINTER]++
CDF[i ≥ SUB_POINTER]--
S92
SUB_COUNT = SUB_MAX?
N
Y
S94
SUB_COUNT++
S96
SUB_POINTER++
SUB_MAX = PDF[SUB_POINTER]/(
SUB_COUNT = 1

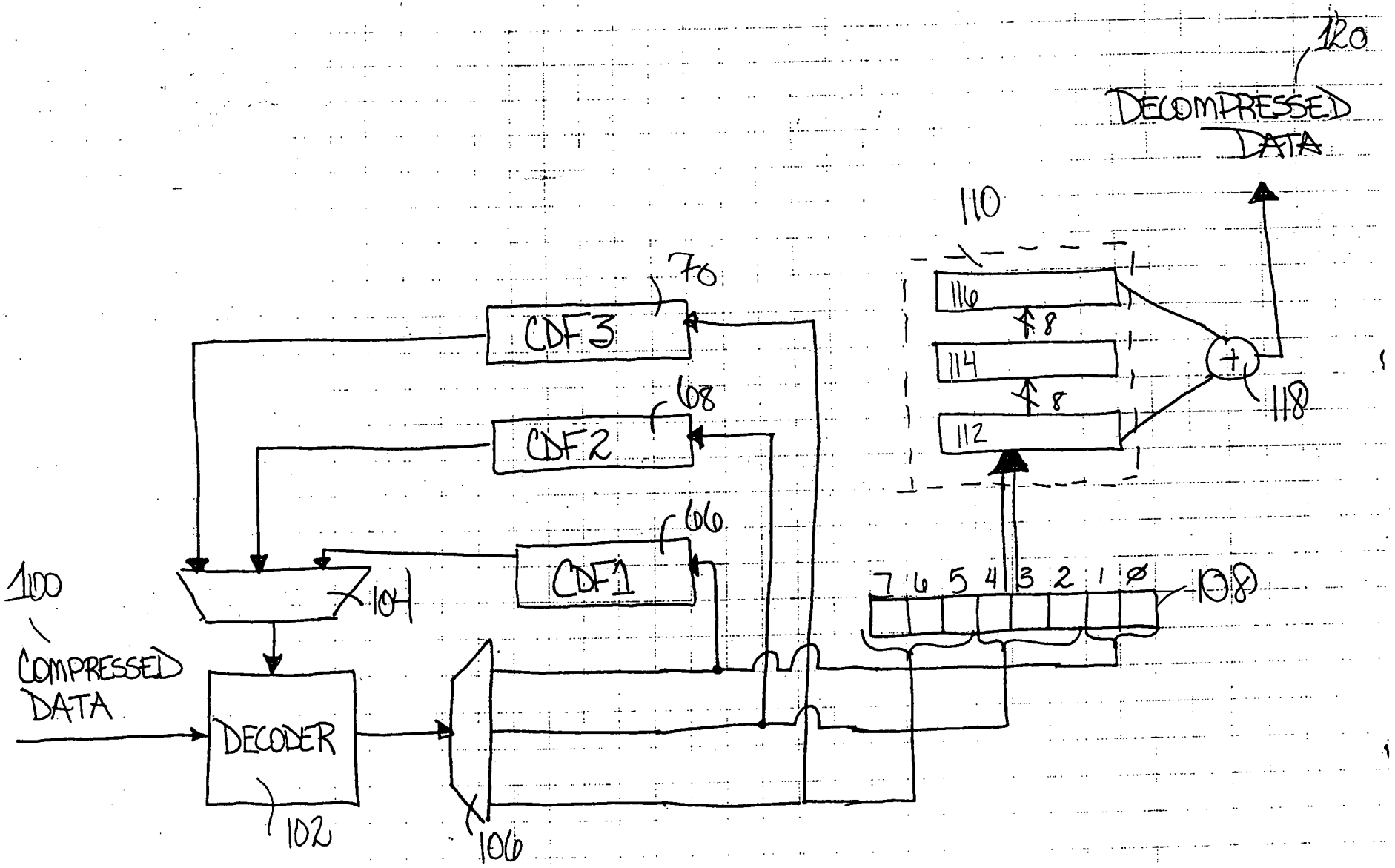

120
DECOMPRESSED DATA
110
116
114
112
8
8
+
118
70
CDF3
68
CDF2
66
CDF1
100
COMPRESSED DATA
104
DECODER
102
106
7 6 5 4 3 2 1 0
108

FIGURE 7

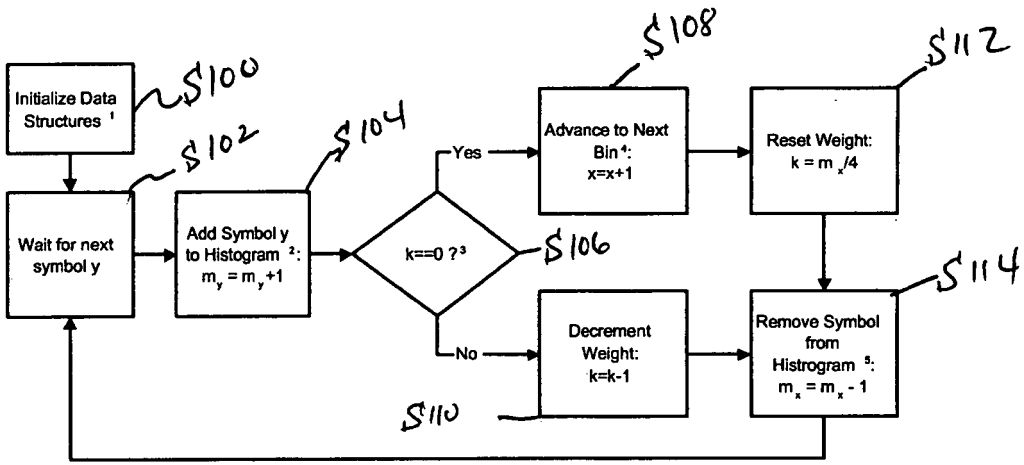

Initialize Data Structures [1]
S100
Wait for next symbol y
S102
Add Symbol y to Histogram [2]: $m_y = m_y + 1$
S104
k==0 ?[3]
S106
Yes
Advance to Next Bin[4]: x=x+1
S108
Reset Weight: $k = m_x/4$
S112
No
Decrement Weight: k=k-1
S110
Remove Symbol from Histrogram [5]: $m_x = m_x - 1$
S114

FIGURE 8

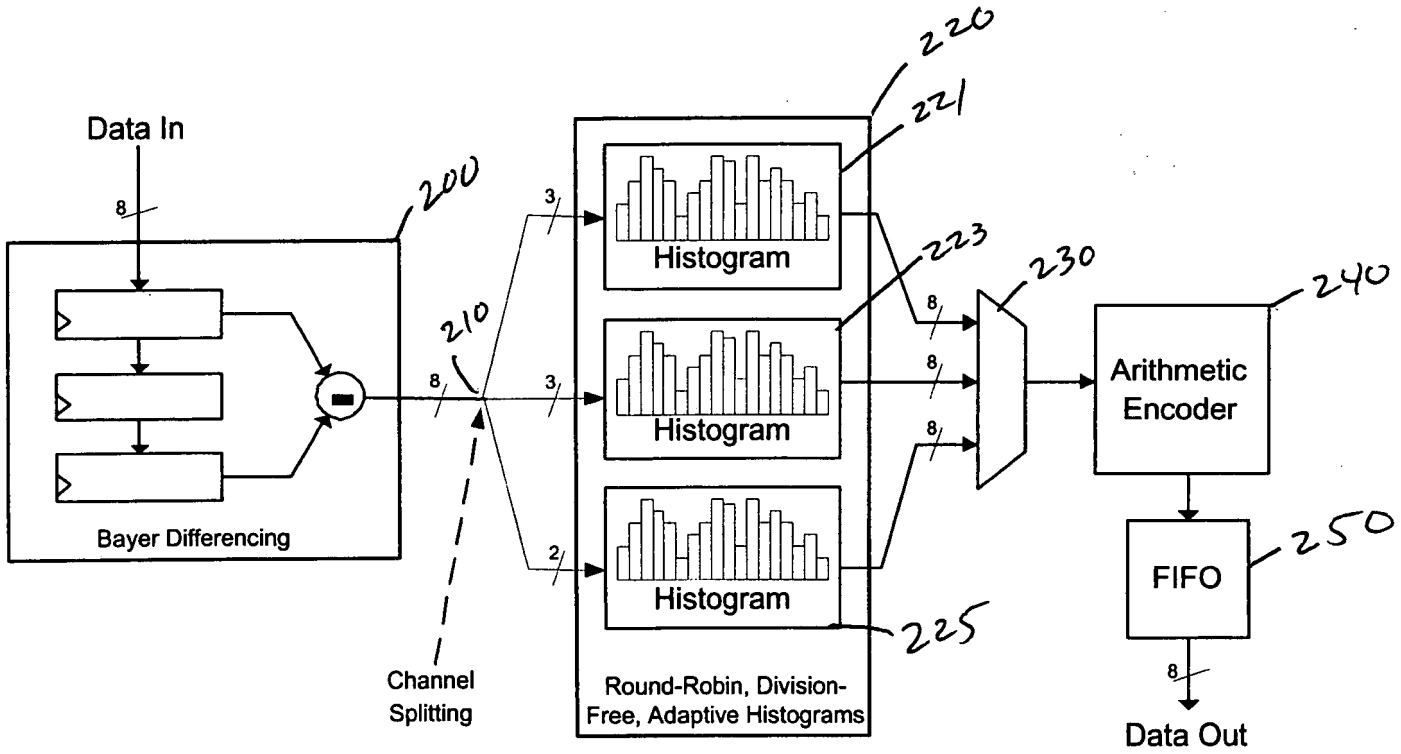

Data In
8
200
Bayer Differencing
210
8
Channel
Splitting
3
3
2
220
221
Histogram
Histogram
Histogram
223
225
Round-Robin, Division-
Free, Adaptive Histograms
8
8
8
230
Arithmetic
Encoder
240
FIFO
250
8
Data Out

FIGURE 9